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prefers pine lands for nesting. I also conclude that there is a neutral strip upon which neither form is found during May and June, and further, that about the only way to identify a Shrike of this species is to take it on its breeding grounds during the breeding season.

PICICORVUS COLUMBIANUS (WILS.),
CLARKE'S NUTCRACKER. ITS
NEST AND EGGS, ETC.

BY CAPT. CHARLES E. BENDIRE.

THROUGH the kindness of that indefatigable naturalist, Mr. Denis Gale, of Gold Hill, Colorado, I am enabled to give to the readers of 'The Auk' his observations on the habits of Clarke's Nutcracker during the breeding season, as well as a good pen picture of the nest and eggs, taken by him March 5, 1888, he having, with his usual generosity, presented both to the National Museum collection. Since I described the nest and eggs of this species in Vol. I of the 'Bulletin' of the Nuttall Ornithological Club, July, 1876, page 44, and again more fully in the April and May numbers of the 'Ornithologist and Oölogist,' pages 105-107 and 113-114, no other nest with eggs has been found, as far as I am aware, and the only account I can find of the taking of one since then, which, however, contained young only, is that of Capt. B. F. Goss, of Pewaukee, Wisconsin, published in the 'Bulletin' of the Nuttall Ornithological Club, Vol. VIII, Jan. 1883, pages 44 and 45.

Mr. Gale's notes read as follows: "On Feb. 16, 1888, while passing down a mountain trail, my attention was drawn to the peculiar note of alarm given by this bird, *Picicorvus columbianus* — not unlike that of our Jay or Magpie — which was promptly answered by its companion. I discovered the birds in separate trees, about fifteen yards distant from each other, and probably fifty yards from where I was standing. Upon closer inspection I perceived that both birds had twigs in their bills. They watched each other, and me as well, for perhaps ten min-

utes, when another call-note was exchanged between them, somewhat similar to the first which had arrested my attention. This second note seemed to me to indicate less alarm; there was more of chuckle or derision in it. The twigs the birds had in their bills were dropped nearly simultaneously, and the pair swooped down the mountain side, and were lost to view almost immediately.

"I determined to follow up this clew, and day after day I closely examined every tree and bush within a radius of half a mile of where I first saw the birds. This close scrutiny resulted in the discovery of three skeletons of old nests, which I assigned to this species. Several entire days were spent at this work without once seeing a bird, and I began to despair.

"On March 5, I tried in a new direction, and when about one third of the mountain had been climbed, about a mile distant from my previous operations, I observed a Nutcracker flying high over my head, and this manœuvre was within an hour repeated a second and a third time, the bird seemingly each time coming from the same quarter. This, I felt assured, meant something, and somewhat renewed my hopes of success. I went on steadily with the search, which, to be effectual, I had arranged in this way: I worked up the mountain side, right and left, upon a swath half a mile wide, taking in from thirty to fifty feet of ascent each time. Eventually I came upon the object of my search, about three hundred yards distant from my second starting point, and about two hundred yards higher than the locality where I had first noticed the bird flying over my head. While doing this, he evidently was reconnoitring, and each time, upon making his rounds, passed near the nest, assuring his mate thereby of his watchfulness. As I worked gradually nearer the nest he was not to be seen, and this seeming indifference of the male, and the pertinacity of the female in covering her nest until almost forcibly dislodged, are great odds against even the most energetic collector.

"The nest was placed eight feet from the ground, in a bushy black pine (*Pinus ponderosa?*) which branched out from the ground with a probable spread of fifteen feet. The tree was about twenty feet high. The nest was situated about thirty inches from the main stem, near a bunch of scrub, and firmly saddled on a three-pronged fork of a stout limb three inches in diameter, with smaller ones growing about and around it, so that nothing save

the overthrow of the tree itself could possibly dislodge it. I discovered the female on the nest while on the upper side of the hill above the nest level. Stepping up within easy reach, the bird seemed to tremble with fear, and slightly snapped her bill, pleading forbearance rather than defiance. Tipping her tail with my hand, she gracefully and noiselessly glided over the edge of the nest, and with closed wings swooped down the mountain side for twenty-five yards or so ; then arresting her downward course, with open wings at a right angle, described the peculiar undulating flight of a Flicker (*Colaptes*) for about fifty yards, and alighted upon a tree in the neighborhood. After noting this, and viewing for a moment two beautiful eggs in a snug, compact nest, I hastily withdrew. The second day after, I found one addition, making three eggs in all, which seems to be the full complement for the species. I waited, however, four days later before taking possession. Each subsequent time I disturbed the female from the nest, she repeating the exact manœuvres she did at first. While I was taking the eggs from the nest she watched me from a tree about fifty yards distant, and for the first time gave the alarm as I had the second egg in my hand. After securing the eggs, I moved away a short distance to note proceedings on the part of the birds. The male was flying about some two hundred yards distant. In five or six minutes after I left the nest site the female, with a single stop for half a minute at the foot of the tree, again covered the nest. After watching her a short time, I again approached her, and when within about ten feet of her, she silently flew off, and protracted her flight in the direction the male was last seen to head. I left the place almost frozen, returning the next day to secure the nest complete in position.

" The nest proper is placed on a platform of dry twigs, mostly those of the western juniper (*Juniperus occidentalis*) ; these average about three sixteenths of an inch in thickness, and vary from eight inches to a foot in length. The twigs, which also help to form the sides of the nest, are deftly wattled together amongst themselves, as well as with some of the smaller lateral branches of the pine limb on which the nest is securely saddled, and are further held together and strengthened with the help of coarse strips of the inner bark of the juniper mixed amongst the twigs and admirably suitable for the purpose. The inner nest is a mass of the latter material, only much finer, the bark having been well

picked and beaten into fibre, and quilted together with the addition of decayed grasses and pine needles, forming an exceedingly snug and warm structure. No hair or feathers of any kind enter into the composition of this nest. The walls of the inner nest are fully one and a half inches thick." Outwardly the nest measures eleven inches in diameter, by seven inches in height. The inner, cup-shaped cavity is four inches wide by three deep. The eggs, three in number, measure $1.37 \times .90$, $1.36 \times .89$, and $1.32 \times .89$ inches. These are elongate ovate in shape, the ground color is a light, delicate, greenish blue, and they are sparsely marked with small, peppery-like spots of grayish brown, mostly about the larger end, and underlying shell markings of grayish lavender. This description applies to the most boldly marked egg of the set, the markings on the remaining two being much fainter and more sparse.

"In the latter part of May, 1888, I was much pleased and interested to find a nest of *Picicorvus columbianus*, in a red spruce tree, about twenty-five feet from the ground, placed close up to the stem of the tree, and on the lee side from our prevailing winds. It was quite bulky, about two thirds the size of our common Colorado Crow's nest, and closely resembling it in make-up and appearance. Its outside was a gathering of sticks and twigs, fastening it in the branches of the tree, several of which were involved. The middle structure was principally composed of the inner bark of the juniper tree. It had accommodated a brood that season. Its value and interest consisted in fixing the identity of the old skeleton nests I had found as belonging to this species beyond a doubt, and altogether they clearly suggest a wider choice of nest sites than the one I sent the National Museum could possibly permit of, by analogy. I discovered altogether five of these old skeletons and two new nests of this season. Four of these occupied similar sites in spruce trees, while three were placed in pines. The nest sent to Washington was the only one *saddled* on a branch away from the main stem. None were over twenty-five feet from the ground, and two I found as low as eight feet up. The majority of sites offered little concealment, but in every case especial care was observed in selecting one affording thorough protection to the nest, and holding it most securely against the assaults of the fierce March winds prevailing in this mountain region. As a suitable and completely hidden

shelter seems to be difficult to find, a more or less partial one is chosen. None of the nests faced the direction of our prevailing winds, and while none were in trees thickly growing together, only one nest was found in what could be termed an isolated tree.

"Five of the sites were within one third of the mountain's height, and two only about one third up. The site of the nest taken containing eggs was at an altitude of about 8500 feet. I do not think that here, in Boulder County, the Clarke's Nutcracker nests much, if any, below this point. It breeds up to 10,500 feet, but at such an altitude fully a month later. The nest found by me was, in my opinion, an early one. These birds feed on beetles and other insects in summer, and they can be seen the year around scavenging about lumber and mining camps, at the foot of the range. Their visits are timed with unerring precision; both they and the Rocky Mountain Jay (*Perisoreus canadensis capitalis*) are on the lookout for the scraps to be found about such places after the dishes are washed, and they seem upon each such occasion to be just in time, and after their feast, more or less satisfactory, according to circumstances, they move off as quickly as they came."

In order to give as full a synopsis as possible of the breeding habits of this interesting species, and as in all probability some of the publications containing the accounts may not be accessible to the majority of the readers of 'The Auk,' I will incorporate the more important portions bearing on the subject in this paper. Capt. B. F. Goss met with these birds in May, 1879, along the western base of the Sangre de Christo Mountains, a few miles southeast of Fort Garland, Colorado. He writes as follows in the 'Bulletin' of the Nuttall Ornithological Club, Vol. VIII, Jan., 1883, pages 44 and 45:

"Clarke's Crow is a common resident of the region described, but has a higher range than Maximilian's Jay. I found it most abundant in the mountain valleys, above the foot hills. In that dry climate the trees on the sunny exposure of the valleys are dwarfed, scattering, and interspersed with thick bunches of bushes, while the opposite side, looking northward, is covered with a heavy growth of timber. It was in and around such timber that I found these birds, and there I looked diligently for their nests. Many times they showed great concern and watched me closely, peering down and scolding from the thick foliage overhead. I thought their nest must be near, and searched everywhere in the neighborhood, even climbing to the tops of high trees; but I have no doubt

now that their nests were across the valley, half a mile away. I spent more than two weeks in this fruitless search, returning every night to camp, tired and disappointed. Any one who has tramped over mountains, in the light air of 9000 feet elevation, will understand how exhausting such labor is; but I particularly wished to get the eggs of this bird, was sure they were nesting in the neighborhood, and did not like to give it up. One evening, after a particularly hard day's work, as I sat by my campfire, looking up the valley, one of these birds left the high timber and flew across to the other side. Its direct and silent flight suggested that it might be going to its nest, and that I had been looking in the wrong locality. Accordingly, with renewed hope, I started early next morning to the hill where I had seen it go. After climbing over the rocks and through the bushes for some time I sat down to rest, when I noticed something on a tree about thirty feet away that looked more like a squirrel's nest than anything else. On closer inspection, however, I saw that it was a bird's nest, and climbing up a short distance, was delighted to find a Clarke's Crow sitting on its nest. She sat very close, only leaving when touched by my hand. The nest was built near the end of a horizontal limb, about ten feet from the ground, in an open, conspicuous situation. It was bulky, coarsely constructed, and very deeply hollowed, the bird when on it showing only part of her bill and tail, pointing almost directly upward. She was soon joined by her mate, when, after hopping about in a listless manner for a few minutes, both disappeared. They were silent when near their nest, but noisy enough elsewhere. On further search I found several old nests and one new one, apparently abandoned. All were similar in construction and situation to the one described, and evidently belonged to the same species. The nest with young was found May 21. From finding these nests, and from other observations made, I am satisfied that Clarke's Crow breeds in open, warm situations, preferring steep hillsides; had I known this earlier I believe that I should have found more of their nests."

My personal observations of this species were published most fully in the April and May numbers of the 'Ornithologist and Oölogist,' Vol. VII, 1882, and extracts therefrom read as follows:

"For some reason not easily explained I had come to an almost positive conclusion that Clarke's Crow nested in hollow trees, and as they act in many respects like certain of our Woodpeckers and frequented the juniper groves fully as much as the pine timber this seemed plausible enough*. The finding of several young birds of this species but a few days out of their nest on May 5, 1875, sitting on the branches of a large

* It must be remembered that at that time nothing positive was known about the breeding habits of Clarke's Nutcracker, excepting Mr. J. K. Lord's account, that in the vicinity of Fort Colville, Washington Territory, they bred in the tops of the tallest pine trees, a statement which I doubted and rather favored Mr. R. Ridgway's surmise of their nesting in hollow trees or stumps.

juniper, in the trunk of which I found a cavity filled with rubbish, and which evidently had been used as a nesting site by either a Sparrowhawk or Red-shafted Flicker the previous season further confirmed me in this view, and caused me to jump at the conclusion that the young birds I saw on that tree clamoring for food had been raised in this very nest. Judging from their size they had left it about a week previously, and I concluded that in order to find eggs I must commence looking for them at least a month earlier or about April 1st, and gave up further search for the season. I waited impatiently for the opening of the season of 1876, which was a very late one. To make sure I started on a systematic search for the nests of these birds as early as March 20th, the snow being at the time from two to four feet deep in the localities frequented by them. During the next four weeks I made at least a dozen trips to the haunts of these birds, and I believe I examined every hollow tree and woodpecker hole known to me within a radius of eight miles of the post, the trees examined being mostly junipers. As I found nothing in them, other species of birds not having commenced nesting yet, and being positive that the Clarke's Crow was then breeding somewhere in the immediate vicinity, from seeing a few about constantly, I commenced to examine the pine trees growing amongst the junipers on the outskirts of the forest proper. I saw nothing, as I thought, which might be taken for a bird's nest in any of the pines (*Pinus ponderosa*), but noticed now and then a round bunch or ball, composed seemingly out of the long hypnum moss taken from the trees themselves, in some of them, which I supposed to be squirrels' nests, particularly as the little Fremont's chickaree (*Sciurus hudsonicus fremonti*, Allen) is quite commonly found in this vicinity. As the majority of these quasi squirrels' nests were by no means easily got at, and having tried to start their occupants with sticks, stones and now and then even with a load of shot and failed invariably to bring anything to light, I ceased to trouble myself any further about them, and more puzzled than ever was about to give up the search when on April 22d I saw a Clarke's Crow flying quietly and silently out of a large pine tree about fifty yards in front of me. This tree had a rather bushy top, was full of limbs almost from the base and easy to climb. As I could not see into the top I climbed the tree, failing to find any sign of a nest therein, and completely disgusted I was preparing to descend again when I noticed one of the supposed squirrel's nests near the extremity of one of the larger limbs about the centre of the tree and about twenty-five feet from the ground, and setting therein, in plain view from above, not a squirrel but a veritable Clarke's Crow.

Well, so I had found their nest at last, quite unexpectedly, and not any too soon, either. As it was, I was almost too late, for the nest contained a young bird just hatched and two eggs with the shells already chipped and on the point of hatching. However, as even damaged specimens, particularly rare ones like these were, are better than none, I took them along but left the young bird in the nest. The parent bird allowed me to almost lay my hand on her before she fluttered off, and

I had scarcely gotten two feet from the nest before she was on it again. During the whole time she remained perfectly silent. Not half an hour after finding the first, I had found a second nest which contained three young birds perhaps a week old. These I sacrificed to science, making a skin of one and preserving the other two in alcohol. They are now, as well as the nest, deposited in the National Museum at Washington, D. C. Between April 24th and 30th, '76, I found at least a dozen more nests; these, however, contained all young in different stages of growth, some of them nearly large enough to leave the nest. Each of these contained but three young.

"In the spring of '77 I commenced my search on March 15th, and although I looked carefully and repeatedly over the entire ground gone over the year before, and over new localities as well, I failed to see a single bird where on the previous season they had been found comparatively plenty. Puzzled to account for their absence I looked around for the possible cause of it, and knowing that these birds live almost exclusively on the seeds of the pine (in fact, all the specimens I have ever dissected, shot mostly in the winter months, however, had their crops filled with these seeds and nothing else), I naturally first examined the trees for their principal food supply and found that not a tree in a hundred bore ripe cones, and although there were many green ones I found none mature. This fact, then, accounted fully and plainly for their absence. During the next winter, '77-78, I found a few of these birds occupying their old haunts again, but not nearly as many as in previous seasons, and I commenced my search as usual again in the latter part of March. On April 4, 1878, I found my first nest. It was placed near the extremity of a small limb, about forty feet from the ground, very hard to get at, and in trying to pull the limb down somewhat with a rope so that it could be reached from a lower limb it broke and the eggs were thrown out of the nest. This also contained three eggs, and incubation, at this early date even, was far advanced.

"On April 8th, '78, I found another nest containing two eggs with good-sized embryos. This was likewise placed in a pine tree and near the extremity of one of the limbs, about sixteen feet from the ground. The only way this nest could be got at was by leaning a pole against the limbs of the tree and climbing to the nest by it, in which, after a good deal of labor and trouble, I finally succeeded.

"The type specimens obtained by me measured respectively 1.22×0.95 inches and 1.20×0.90 inches. The ground color of these eggs is a light grayish green and they are irregularly spotted and blotched with a deeper shade of gray, principally about the larger end. On the smaller egg the spots are finer and more evenly distributed. The last two eggs obtained are somewhat larger, measuring 1.26×0.95 and 1.30×0.92 inches. Their markings although somewhat finer are about the same as in the type specimens. They are elongated, oval in shape and considerably pointed at the smaller end. The second set of eggs found by me, which, unfortunately, were broken, were more of a greenish ground color and also

much heavier spotted. There is no doubt that there will be considerable variation found when a number of sets of eggs of this bird are placed together for examination. That this species should only lay but three eggs to the set seems also rather strange, but as far as my personal observations go, such is the fact.

"The nests, although looking quite small when viewed from below, are rather bulky affairs after all when closely examined, their base consisting of a platform of small sticks and twigs, mostly of the white sage, which are laid on a sufficiently strong pine branch and generally as far out as possible. On this the nest proper is placed, which is composed of dry grasses, vegetable fibres, hypnum moss, and the fine inner bark of the western juniper (*Juniperus occidentalis*.) These various materials are well incorporated together and fastened to the branch and pine needles on which it is placed, and makes a warm and comfortable structure. The outer diameter of the only nest measured by me (that is, the compact portion of it) was eight and one-half inches; inner diameter, four and one-half inches; depth inside, three and one-half inches; outside, five inches. As a rule, the nests were well concealed from view below, and almost invariably placed on or near the extremity of a live limb at various heights from the ground.

"Isolated clumps of pine trees growing near the edges of the forests or mountain valleys, as well as among juniper or mountain mahogany groves, seemed to be the favorite localities frequented by these birds during the breeding season; in fact, I have scarcely ever noticed them any distance in the forest unless there were frequent openings, small valleys, etc., interspersed with timber. These birds appear to raise but one brood during the season, . . . and in the vicinity of Fort Harney they disappear about the end of May or early in June, gathering about that time in considerable flocks, and are not seen again till about October. They probably spend the summer months in the higher mountain regions in the vicinity.

"At all other times a social, inquisitive and exceedingly noisy bird, the Clarke's Crow during the breeding season is exactly the reverse. In vain one may watch and listen to hear their usual and by no means musical call note, "chaar, chaar," which so easily betrays their presence at other times. . . . Their whole character seems to have undergone a sudden radical transformation. They remain perfectly silent, seem to hide and would scarcely be noticed, even where comparatively abundant, unless closely looked after."

To this account I have little to add of interest. In the matter of food, Clarke's Crow, or Nutcracker, as now called, is omnivorous, certainly nothing at all eatable comes amiss. While during the winter months their food, perhaps from necessity, consists principally, if not altogether, of the seeds of various species of coniferous trees—the extracting of these entailing considerable strength and labor, but which is facilitated to a certain extent with

the help of their strong claws and sharp bill, admirably adapted to the purpose,—their bill of fare for the greater part of the year is quite varied, including berries of different species, insects of all kinds, as well as their larvæ, butterflies, which they catch very dexterously on the wing, and especially grasshoppers and the large, wingless, blackish brown crickets (*Anabus simplex*), which in some seasons are to be found overrunning large sections of country in countless numbers, devouring everything green and eatable in their way. These repulsive looking objects are in turn preyed on by numerous species of mammals, as well as birds and fishes, and even the Pah-Utes or Snakes, as well as the various tribes of Digger Indians inhabiting the Great Basin, consider these selfsame crickets quite a delicacy, and yearly gather large quantities of them, which, after being roasted and dried, are stored away in mats for winter use. I have more than once observed flocks of Clarke's Nutcrackers of considerable size scattered out over the sagebrush-covered mesas (table-lands) near the foothills of the Blue Mountains in Oregon, actively and industriously engaged in catching these crickets, and apparently enjoying them. At such times they are especially noisy, calling each other constantly, and having a jolly good time generally.

The stomachs of all the nestlings examined by me, however, contained only an oily cream-colored pasty mass, composed exclusively of the hulled seeds of the pine or other conifers, easily recognized by its not unpleasant odor, and this seems to be the only food they are fed with while in the nest.

Picicorvus columbianus, while occasionally rather tame and unsuspicious, and an inquisitive bird at all times, is usually shy and not easily approached within shooting distance. Now and then I have seen an individual, bolder than the rest, alight amongst my chickens in the backyard and feed with them, but such occurrences are rather rare and infrequent. In the summer they spend considerable of their time on the ground in search of food. To the hunters and trappers in Oregon the bird is known under various names, such as Meatbird, Moosebird, and Camp-robbler, but the same names are equally applied to the Oregon Jay (*Perisoreus canadensis obscurus*), which has much the same habits. In winter the two species are often found associated together. At Fort Harney, Oregon, the breeding range of Clarke's Nutcracker extends as low down as 5200 feet altitude, and I am

satisfied that it breeds at about the same elevation in the vicinity of Fort Klamath, Oregon, where, however, these birds were rather scarce.

An abundant and suitable food supply has unquestionably a great deal to do with the movements of these birds, and while they might be called resident in most places where they are found, they, like many other species usually considered residents throughout the year, are more or less migratory. Their range northward is very extended, specimens having been obtained on the Putnam River, Alaska, close to the Arctic Circle and to the tree limit.

SUMMER BIRDS OF EASTLAND COUNTY, TEXAS.

BY E. M. HASBROUCK.

EASTLAND County, Texas, is situated between latitudes 32° - 33° and longitudes 98° - 99° or a little northeast of the geographical centre, and is known throughout the country as the poorest and most unattractive portion of the State. The elevation varies from twelve hundred to sixteen hundred feet, and the entire County, as well as a number of those lying to the east, is one series of terraces, beginning a little west of Cisco and extending through Erath and Bosque Counties, until the valley of the Brazos is reached. Water is extremely scarce and the timber, although pretty generally distributed, is almost entirely of oak, and comprises four species, known as post-oak, bur-oak, black jack, and 'shinnery.' This last is a short, stunted bush, frequently covering hundreds of acres and rarely exceeding four or five feet in height.

The observations recorded were made while accompanying the Geological Survey, and while this list of sixty species is by no means complete, still it will, I hope, be of some value in showing the partial distribution of certain peculiar and rare forms. Several species of Hawks, which were numerous, I was unable to secure and identify, as my time was not my own.

I. *Ardea herodias*. GREAT BLUE HERON.—Present, but rare from scarcity of water; two individuals seen. A number were observed on